

ABSTRACT OF THE DISCLOSURE

Apparatus and methods are provided for an improved on-the-fly rounding technique for digit-recurrence algorithms, such as division and square root calculations. According to one embodiment, only two forms of an intermediate result of an operation
5 to be performed by a digit-recurrence algorithm are maintained. A first form is maintained in a first register and a second form is maintained in a second register. Responsive to receiving digits 1 to $L-2$ of the intermediate result from a digit recurrence unit, where L represents a number of digits that satisfies a predetermined precision for the operation, both forms of the intermediate result are updated by register swapping or
10 concatenation under the control of load and shift control logic and on-the-fly conversion logic. Then, a rounded result is generated by determining digits d_{L-1} and d_L and appending a rounded last digit to the appropriate form of the intermediate result.